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ERAWATCH Country Reports 2013: Iceland

Snorri Björn Sigurdsson

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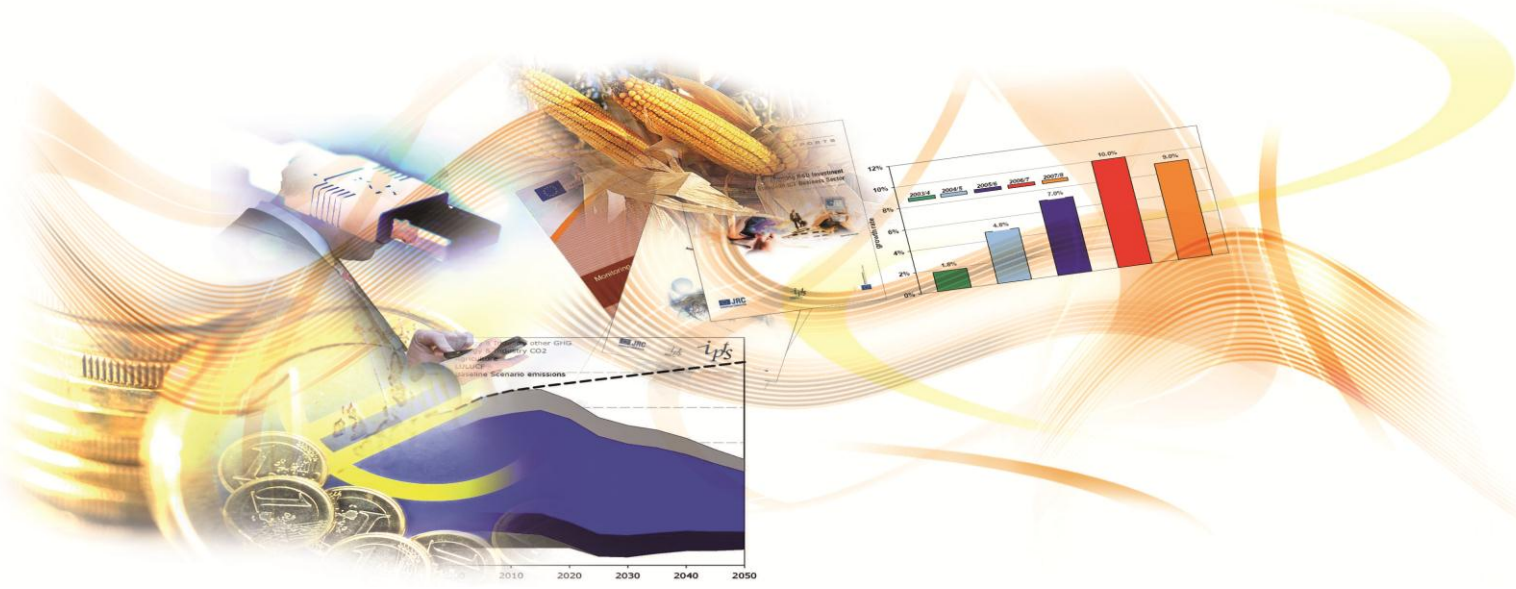

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Abstract

The Analytical Country Reports analyse and assess in a structured manner the evolution of the national policy research and innovation in the perspective of the wider EU strategy and goals, with a particular focus on the performance of the national research and innovation (R&I) system, their broader policy mix and governance. The 2013 edition of the Country Reports highlight national policy and system developments occurring since late 2012 and assess, through dedicated sections:

- national progress in addressing Research and Innovation system challenges;
- national progress in addressing the 5 ERA priorities;
- the progress at Member State level towards achieving the Innovation Union;
- the status and relevant features of Regional and/or National Research and Innovation Strategies on Smart Specialisation (RIS3);
- as far relevant, country Specific Research and Innovation (R&I) Recommendations.

Detailed annexes in tabular form provide access to country information in a concise and synthetic manner.
The reports were originally produced in December 2013, focusing on policy developments occurring over the preceding twelve months.

ACKNOWLEDGMENTS AND FURTHER INFORMATION

This analytical country report is one of a series of annual ERAWATCH reports produced for EU Member States and Countries Associated to the Seventh Framework Programme for Research of the European Union (FP7). ERAWATCH is a joint initiative of the European Commission's Directorate General for Research and Innovation and Joint Research Centre.

The Country Report 2013 builds on and updates the 2012 edition. The report identifies the structural challenges of the national research and innovation system and assesses the match between the national priorities and the structural challenges, highlighting the latest developments, their dynamics and impact in the overall national context.

The first draft of this report was produced in December 2013 and was focused on developments taking place in the previous twelve months. In particular, it has benefitted from the comments and suggestions of Inger Midtkandal and Dr Mariana Chionel from JRC-IPTS. The contributions and comments from DG-RTD are also gratefully acknowledged.

The report is currently only published in electronic format and is available on the ERAWATCH website. Comments on this report are welcome and should be addressed to jrc-ipts-erawatch-helpdesk@ec.europa.eu.

EXECUTIVE SUMMARY

The ministry for Education, Science and Culture is the key ministry in charge of implementing R&D policy in Iceland. The Science and Technology Policy Council (STPC) is the key strategic body at the core of the R&D policy system in Iceland. The Icelandic Centre for Research has an important role in preparation and implementation of the STI policy. Research policy is a national policy in Iceland. There is no specific innovation policy in Iceland. The STPC policy is supposed to cover that field. The policies are put forward in general terms, are all inclusive and without emphasis on specific sectors. There are really no clear thematic/sectoral R&D policies in Iceland that are approved by the government. The research is centralised in the sense that one body, the STPC, is the central policy maker. The Icelandic Centre for Research (Rannis) administers most of the competitive funds.

It is important to remember Iceland´s extremely low population which makes all comparison difficult except when comparing on per capita basis. Far the biggest part of research activity takes place in the capital area.

A new government took office in May 2013. It halted the accession negotiations with the EU in June. It is unclear if or when they will be continued. In its policy statement the government places emphasis on innovation in all sectors, it is also stated that changes will be made to tax legislation to enable those working on research to stand on equal foot with foreign competitors and collaborators. Access of start-ups to equity capital is to be improved and the support system simplified.

In the 2013 budget an increase of € 8.1 Million (23%) in total was approved for the Research Fund, the Technology Fund and for the Strategic Programs. The new government decided to cut part of that increase in the budget for 2014. The government has also declared that these increases will be withdrawn in steps until 2016. The reason given is that expected funding did not materialise.

A new policy for the STPC

In December 2013 a new policy for the STPC for the years 2013 – 2016, was published. The policy has four main themes:

1. *Human resources and recruitment*

   Increase the recruitment in the research and innovation sector by strengthening doctoral studies, strengthening science and technology education, shortening the education process and increasing cooperation between companies, research institutions and the education system.

2. *Cooperation and efficiency*

   Strengthen the cooperation between universities, research institutions and companies with the aim of increasing impact and efficiency.

3. *Growth and value creation*

   Increase funding and investment in research and innovation, both in the private and public sector.

4. *Impact and follow up*

   Evaluate the quality and impact of research and innovation activities and support continuous reform.

Considering how much the funding for R&D and universities has been cut it is clear that it will be a big challenge to attain the goals that have been set out. Industrial policy for Iceland is in the final stage of preparation.

Iceland has one of the highest R&D intensities in Europe and has an excellent science base according to Iceland Country Profile 2013. The same source however points out that it is a main challenge for Iceland is to transform this into economic competitiveness[1]. The R&D intensity was 2.4% in 2011, which is considerably lower than in 2009, but still higher than the EU average. A significant share of the total R&D comes from the public sector and low business enterprise expenditure on R&D is thought to be a key weakness of the Icelandic research and innovation system.

There are no national research or innovation priorities except those general themes set in the strategy of the STPC.

The main structural challenges to the R&I system in Iceland:

- **Weakness in governance and planning**

There is a lack of connection between the stated government policy and how it is implemented through funding. It is a problem for long term planning that the government budget is approved on an annual level. The policy of the STPC is not submitted to the parliament and approved there as a resolution of parliament. There needs to be a clear policy set forward as to in what areas Iceland will emphasise in the future.

- **Lack of funds**

The biggest challenge for the R&I system in Iceland is lack of funds. The proportion of public sector in R&D is unusually high or 42% in 2011. There is a lack of end to end support system from basic research to market.

- **A fragmented system**

Too many universities and research institutions compared to the total population. Most of the universities and institutions are small or very small. The research environment is not attractive to young scientists who are entering the workforce.

- **Low level of competitive funding**

A larger proportion total funding of R&I needs to go through competitive funding. The demand for grants out of the funds is much greater than what can be met with the current funding levels. The grants given are relatively low.

- **Evaluation and quality control**

Performance evaluations need to have more impact on the allocation of R&D funds. Around 80% of public funds for research go directly to institutions without any kind of impartial evaluation. A comprehensive evaluation of the R&D system has not been carried out in the last few years.

What is being done

New laws regarding the budget process are being prepared that will make government planning more focused and make long term planning possible, while at the same time increase the steadiness of the process. According to the proposals, the government shall put forward a five year financial policy in April each year. This gives those working in the field of R&D an opportunity to do more long term planning.

[1] Research and Innovation performance in Iceland - Country profile - 2013 http://ec.europa.eu/research/innovation-union/pdf/state-of-the-union/2012/countries/iceland_2013.pdf

As the economic recovery quickens more funds will be made available both from the government and the private sector. The STPC policy for 2013-2016 puts emphasis on increasing funding for R&D. The tax system will be used to encourage investment by companies and individuals in science and innovation and tax incentives will be introduced to increase investment in start-ups. It is also suggested that competitive funding for universities and research institutions will be increased so that it will be about one third in 2016.
The STCP recommends further that the framework for science and innovation in Iceland should be simplified, integrated, and where appropriate also use opportunities to integrate universities and research institutions. An ERAC peer-review of the Icelandic research and innovation system is being conducted.

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1 BASIC CHARACTERISATION OF THE RESEARCH AND INNOVATION SYSTEM

Real GDP was negative in 2009 and 2010. It turned positive in 2011, was 1.5% in 2012 and is expected to have been 3.3%[2] in 2013. Despite positive GDP growth every year from 2011, GDP is only expected to reach the level of 2007 in 2014. According to the Innovation Union Scoreboard 2013, Iceland is an *innovation follower* with a below average performance. Relative strengths are in Finance and support. Relative weaknesses are in Human resources and Intellectual assets. High growth is observed for new doctorate students and Community designs. A strong decline is observed for Community trademarks and Sales of new-to-market and new-to-firm innovations. Growth performance in Human resources is well above average and in Economic effects well below average. Iceland has the highest performance in three indicators: International scientific co-publications, Public R&D expenditures and Public-private co-publications. Iceland's growth performance is above that of the EU27.

Gross domestic expenditure on R&D as % of GDP was 2.9% in 2009 and 2.6% in 2011 according to figures from the *Icelandic Centre for Research (unpublished, Rannis)*. Total expenditure on R&D in 2011 was € 265.5 Million[3]. The state contribution to R&D was € 111.6 Million or 42%. According to the Iceland 2020 Strategy document 4% of the GDP shall be allocated to research development and innovation by 2020. A new policy of the Science and Technology Policy Council (STPC) for the years 2013 – 2016 was published in December 2013[4]. It proposes that by 2016, 3% of GDP shall be allocated to science and innovation.

The Ministry for Education, Science and Culture is the key ministry in charge of implementing R&D policy in Iceland, but other ministries also have a role to play, especially the Ministry for Industries and Innovation, due to their responsibilities for research organisations in their own fields.

The Science and Technology Policy Council (STPC) is the key strategic body at the core of the R&D policy system in Iceland. It includes 20 members and is headed by the prime minister. The Minister of Finance and Economic Affairs, The Minister of Industry and Commerce and The Minister of Education, Science and Culture are members of the Council. The role of this body is to define the strategic orientation for the science and technology policy in Iceland. Its objective is to strengthen scientific research and graduate education in Iceland by supporting basic research.

On the operational level, the *Icelandic Centre for Research (Rannis),* has been entrusted with the important role of preparation and implementation of STI policy and dissemination of

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2 http://www.hagstofa.is/?PageID=2602&src=https://rannsokn.hagstofa.is/pxis/Dialog/varval.asp?ma=THJ01702%26ti=%C1rsbreyting+landsframlei%F0slu+1980%2D2013%26path=../Database/thjodhagsreikningar/landsframleidsla_althj/%26lang=3%26units=Hlutfall

3 Exchange rate of the Icelandic króna to € according to The Central Bank of Iceland was 159.77 on Dec. 23. 2013. This exhange rate is used for conversion throughout this paper. http://www.cb.is/exchange-rate/

4 http://www.vt.is/media/197441/VTR_Stefna_2013-2016.pdf (Only available in Icelandic yet.)

information to society. Rannis reports to the Ministry of Education, Science and Culture, and serves the Icelandic science and technology community as a whole. It provides technical support to STPC and the Council's committees as well as to funding bodies, and manages and follows up implementation of most research programmes.

Research policy is set on a national policy level in Iceland; there are no regional research programmes. The research system is centralised in the sense that one body, the STPC is the central policy maker. Then Rannis administers most of the competitive funds, assists and promotes international collaboration opportunities, analyses the nature and scope of research, and demonstrates the impact of research and innovation on national welfare. The system is decentralised in the sense that there are many performers of research and many of them are small.

The Innovation Center Iceland (ICI), under The Ministry of Industries and Innovation, is in charge of technology development and technology transfer to companies and supports innovative businesses. Its mission is to increase innovation, productivity and competitiveness of Icelandic business by doing innovative technology research, diffusing knowledge and giving support to entrepreneurs and start-up companies. IMPRA, a part of ICI, assists entrepreneurs in the start-up, growth and management of SMEs. IMPRA operates an Incubator Center which offers support and facilities to start-up companies working on innovative business ideas.
IMPRA also runs an Enterprise Europe Network office (EEN) to encourage cooperation between Icelandic and European companies.
The headquarters of Innovation Center Iceland are in Reykjavík, but the Center also has seven other work locations spread across Iceland.

There are seven nationally accredited higher education institutions in Iceland. Three universities have been accredited by the Ministry to run doctoral training The leading public HEI, the University of Iceland, is the only university offering a complete range of disciplines. It is also the most substantial public R&D performer. Research excellence is the cornerstone of all doctoral training in Iceland. Compared to 27 other European countries, Icelandic HEIs academic independence is great, independence in relations to human resources is average, there is little organisational independence and financial independence is also little[5]. The University of Iceland has decided to apply the Principles of Innovative Doctoral Training and is working on implementation.

Five companies, Actavis, CCP, Decode Genetics, Marel and Össur have been the largest contributors to private research and development with about 70% of total spending in 2009.[6] Marel is the only Icelandic company to be on the list of World 2000 companies ranked by R&D[7]. It ranks 1124 and spent €53.4 million in 2012. According to The Taxell Report[8] geothermal science, health and life sciences as well as creative industries/ICT are thought to provide a lot of potential to Iceland. The Icelandic Ocean Cluster and the Iceland Geothermal Cluster have grown very fast in the last few years and are expected to continue to grow fast.

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[5]http://agir-ups.info/wp-content/uploads/2013/01/University_Autonomy_in_Europe_II_-_The_Scorecard.sflb_.pdf

[6] NEW VISION (page 41), Forsætisráðuneytið http://www.forsaetisraduneyti.is/media/Skyrslur/ny-syn-des-2012.pdf

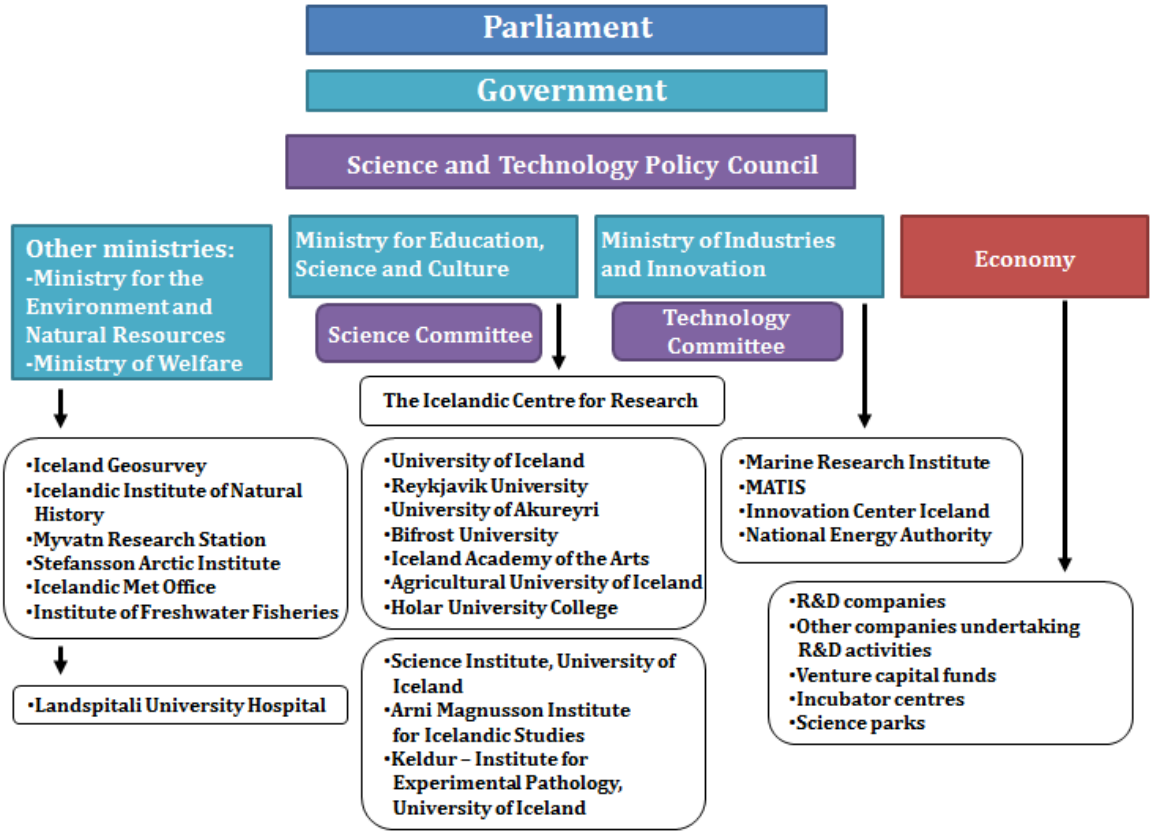
[7] http://iri.jrc.ec.europa.eu/documents/10180/99853/Ranking%20of%20the%20world%20top%202000%20companies

[8] http://vt.is/files/Education,%20research%20and%20innovation%20policy.%20Sk%C3%BDrsla%20erlendrar%20s%C3%A9rfr%C3%A6%C3%B0inefndar%20ma%C3%AD%202009_2088871179.pdf

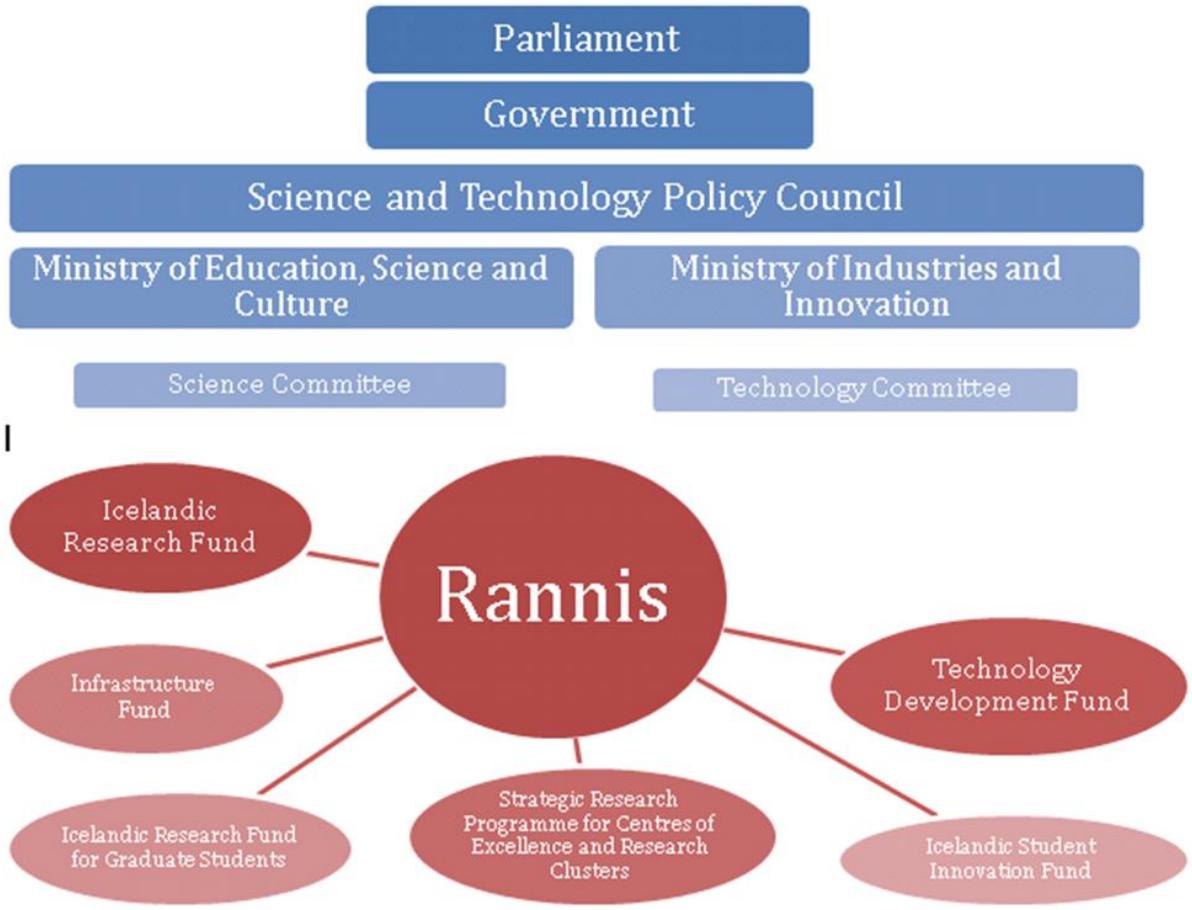
The figures below depict the main actors and institutions as well as funding flow within the Icelandic research system.

Iceland´s research and innovation system governance structure

From 1. September 2012:



Organization of Icelandic competitive research funds under the auspices of the Science and Technology Policy Council



Multi-annual budget programming is not provided for in the government budget in Iceland. The budget planning is done on an annual basis, usually introduced to Althing (Parliament) in the autumn and the budget is then approved late December for next fiscal year. Allocations for implementing multi-annual policies/programmes are reported in the annual budget bill as "binding agreements", although they need formal approval by Althing through the adoption of the annual national budget. Multi-annual programming is practiced by certain government agencies and funds that allocate funding to projects of more than one year's duration (e.g. research and technology grants with up to seven years projects).

The policy of the former government was to increase funding for research and development as a part of the planned response to deal with the effects of the financial crisis in 2008. Nevertheless, the government finances was in such a state that funding for research and development decreased between 2010 and 2011. However the funding increased between 2011 and 2012 by 2.6% and between 2012 and 2013 by 7.6%. Public funding for research and development through the competitive programs decreased by almost 15% between the years 2008 and 2011. According to STPC, public funding for universities, institutes and funds decreased by € 12.5 Million, (fixed prices) or more than 20%, between the years 2008 and 2012.

Composition of funding for research and development has not changed much between the years 2009 and 2011. As a share of the total funding the government has gone up by 3% while the

corporate side has gone down by 2%. Foreign funding has gone up by 2% while private non-profits have not changed. In 2009 83% of public funding for research and development was tied to appropriations for universities and institutions while 17% was competitive funding. In 2013 these ratios were 75% for universities and institutions and 25% for competitive funds[9].
The investment plan for Iceland 2013-2015[10] was approved with the passage of the government budget for 2013 in December 2012. This budget gave an increase of € 3.4 Million for the Research Fund, € 3.4 million for the Technology Development Fund and for the Strategic Programs there was an increase of € 1.3 Million.

The new government in Iceland that took office following the election in April 2013 did propose in its budget proposal for 2014 to cut the funding for the Research Fund by € 1.7 Million, the Technology Development fund by € 1.8 Million and the Strategic Programs by € 1.7 Million. In the budget it is further proposed that all the increase in funding to the competitive funds that was approved in the 2013 budget will be withdrawn by 2016.
In the final budget for 2014 the cuts approved were € 1.3 Million for the Research Fund, € 1.8 Million for the Technology Development Fund and € 1.3 Million for the Strategic Programs. The proposal of withdrawing all increases of funding to the competitive funds is a declaration that has no legal binding.

[9] Figures from Rannis. Not published yet

[10] http://eng.forsaetisraduneyti.is/news-and-articles/nr/7180

2 RECENT DEVELOPMENTS OF THE RESEARCH AND INNOVATION POLICY AND SYSTEM

2.1 National economic and political context

Iceland is an island, 103.000km^2, with a population of 326.000 as of 1. January 2014, which is an increase of 1.2% on the previous year. Close to 2/3 of the population lives in the capital area. The population growth is in the capital area while in most other parts of the country the population has decreased. The country is one NUTS 1 region, one NUTS 2 region and 2 NUTS 3 regions. The capital area is one NUTS 3 region and the rest of the country is another NUTS 3 region. The country is very sparsely populated with just over 3 inhabitants per km^2. This makes Iceland the most sparsely populated country in Europe by some distance. Iceland's population is only 0.0634% of the EU while Iceland is 1% of the land mass of EU.

Real GDP was negative in 2009 and 2010. It turned positive in 2011, was 1.5% in 2012 and is expected to be 3.3% in 2013[11]. Despite positive GDP growth every year from 2011, GDP is only expected to reach the level of 2007 in 2014.

Unemployment has decreased from 7.6% in 2010 to 6.0% 2012 and was 5.4% in 2013 (EU average 10.8%). In part the explanation lies in the mobility of the workforce, many left Iceland to find employment abroad with Norway being the most popular destination. Many of these were individuals with university degrees, such as nurses and doctors. A number of initiatives were launched by the state in cooperation with local governments, unions and employees to reduce the unemployment. Businesses were given incentives to hire and it was made easier for the unemployed to retrain. The employment rate was 78.2% in 2010 and 79.7% in 2012 (EU average 64.1%).

The consequences of the economic crisis and the collapse of the banking system in 2008 can mainly be seen in the low levels of investment and the high levels of public debt. The total debt of the state is now € 9.482 Billon or close to 80% of GNP. The government has run a deficit from 2008 but the primary budget has been positive since 2012. According to the budget of 2014 a surplus is foreseen in 2014, though a small one.

In 1994, Iceland became fully integrated into the European single market when it joined the European Economic Area Agreement (EEA), together with Norway and Lichtenstein. Iceland is also part of the group of European Free Trade Agreement (EFTA), together with Norway, Lichtenstein and Switzerland. Through the EEA Agreement, Iceland has taken on a large part of the EUs single market legislation. In fact, 22 of the 35 chapters of all EU legislation have been incorporated into Icelandic legislation, and Iceland participates in various EU programmes, including the EU Framework Programmes for Research and Technology.

[11] http://www.statice.is/

A new government, a coalition government formed by the Independence Party and the Progressive Party, took office following parliamentary elections in April 2013. In the policy statement[12] of the new government it says that the accession negotiations with the EU will be put on hold and an assessment will be made of the status of the negotiations and developments within the EU. The assessment will be submitted to the parliament for discussion and presented to the nation. Accession negotiations will not be continued without a prior referendum. The negotiations were halted in June 2013. The aim was to submit the assessment of the status of negotiations and the developments within the EU before end of 2013. No decision has been made on when or if a referendum will be held and when this is written at the end of March 2014 the aforementioned assessment has been submitted to the parliament and is being discussed. The foreign minister has put forward a proposal in Parliament on the withdrawal of Iceland's application for accession to the European Union. It is still unclear if the proposal will be accepted by the parliament or if there will be made changes to it.

In its policy statement the new government places emphasis on innovation in all sectors. It says that productivity needs to be increased in Iceland; creating an environment to encourage innovation in existing enterprises, public operations and new undertakings is a premise for long-term growth. To ensure optimal utilisation of funding for research and development, the government emphasises co-ordinating the operating base and operating environment of public institutions responsible for R&D.

According to the government platform changes need to be made in tax legislation to enable those working on research to stand on equal foot with foreign competitors and collaborators. By so doing universities, companies and individuals can enjoy the fruits of their work in a similar manner as is customary elsewhere. Co-operation and synergies between companies need to be stimulated to undertake larger development tasks in individual sectors, in part by creating a cluster strategy, improving access of start-ups to equity capital and simplifying the support system. Efforts will also be directed at integrating public programmes and drafting special regional programmes in collaboration with municipalities.

2.2 Funding trends

As part of the Investment Plan for Iceland 2013-2015, a total increase of € 8.1 Million was approved for the Research Fund, the Technology Fund and for the Strategic Programs in the 2013 budget. As these funds are distributed on competitive basis, this resulted in a 23% increase of governmental contribution to the competitive funds for R&D. This also meant that the proportion of the competitive funds as percentage of total public expenditure on R&D increased from 17% in 2009 to 25% in 2013. The government has declared that these increases will be withdrawn in steps until 2016. The reason given is that expected funding did not materialise.

According to Rannis, and published in the budget proposal for 2014[13], numbers indicate that R&D related expenditure was 8% lower in 2011 than it was in 2009. Based on this it can be estimated that Iceland is 10th among the 30 OECD nations when expenditure on R&D is measured in comparison to GNP. In 2011 private industry provided 48% of the funds, the government 42% and foreign sources of funds were 10%.

[12] http://www.government.is/government/coalition-platform/
[13] Fjárlagafrumvarp 2014, page 356 http://www.althingi.is/altext/143/s/0001.html

The halting of Iceland's accession negotiations with the EU in June 2013 have already stopped EU co-funding of various programs intended to strengthen research infrastructures and knowledge clusters across the country. Otherwise funding for research and development has little changed.

2.2.1. Funding flows

One of the targets of "Iceland 2020 policy statement" is that 4% of GDP shall be allocated to research, development and innovation by 2020[14]. The investment by the private sector is targeted to 70% against a 30% contribution from the public sector through both competitive funds and research programs.

A new policy of the Science and Technology Policy Council (STPC) for the years 2013 – 2016 was published in December 2013[15]. It proposes that 3% of GDP shall be allocated to science and innovation by 2016. It is not explained how this goal is to be achieved and is perhaps, in light of cuts of funding of the competitive funds in the 2014 budget, a bit optimistic.

As has been described in past Country Reports, the effects of the financial crisis hit Iceland very hard, and the funding for research and development decreased. According to a new estimate by Rannis € 265.5 Million were spent on Research & Development in 2011. That is around 2.6% of GDP. Rannis has also reassessed R&D in 2009 and has accordingly lowered formerly published figure from 3.1% of GDP down to 2.82%.

Rannis has not reassessed the measurements back further than 2009. When these new measurements of R&D as a % of GDP are examined, it appears that R&D has contracted by 8% between 2009 and 2011[16] and 11% between 2008 and 2011. Private industry holds the largest share of the contraction with 14% while private non-profit foundations hold the smallest share with 1%.

The largest drop in research between 2008 and 2011 has been within companies in chemical and pharmaceutical industries, including biotech. Considerable increase in research can at the same time be seen in companies in computer processing and services and other manufacturing except for food- and chemical industries.

Table 1. Basic indicators for R&D investments

	2009	2010	2011	2012	EU (2012) **
GDP growth rate	**-6.6%**	**-4.1%**	**2.7%**	**1.5%**	**-0.4%**
GERD (% of GDP)	**3.11%**		**2.4%**		**2.06%**
GERD (euro per capita)	**843.8**		**760.2**		**525.8**
GBAORD - Total R&D appropriations (€ million)	**94.435**	**97.894**	**102.583**	**111.404**	**90.670.309**
R&D funded by Business Enterprise Sector (% of GDP)	**1.64%**	**1.39%**	**1.26%**		**1.3%**

[14] http://eng.forsaetisraduneyti.is/media/2020/iceland2020.pdf

[15] http://www.vt.is/media/197441/VTR_Stefna_2013-2016.pdf (Only available in icelandic yet.)

[16] Fjárlagafrumvarp 2014, bls 244, http://www.althingi.is/altext/143/s/pdf/0001.pdf

R&D performed by HEIs (% of GERD)	**25%**		**27%**		**24%**
R&D performed by Government Sector (% of GERD)	**20%**		**18%**		**12%**
R&D performed by Business Enterprise Sector (% of GERD)	**53%**		**53%**		**63%**
Share of competitive vs. institutional public funding for R&D	**na**				
Venture Capital as % of GDP (*Eurostat table code tin00141)*	**na**				
Employment in high- and medium-high-technology manufacturing sectors as share of total employment *(Eurostat table code tin00141)*	**na**				
Employment in knowledge-intensive service sectors as share of total employment (*Eurostat table code tsc00012)*	**na**				
Turnover from Innovation as % of total turnover *(Eurostat table code tsdec340)*		**6.1%**			**13.4%**

2.2.2. Funding mechanisms

2.2.2.1 Competitive vs. institutional public funding

The funding levels from the government are set in the yearly budget. This is both for competitive funds supervised by Rannis and AVS fund that is an independent fund supervised by the Ministry of Industries and Innovation. The funding for the universities and research institutions is through block funding. The governmental appropriations to research institutions are not based on a comprehensive policy on budgetary targets, but rather on the specific needs of institutions and industries. The vast majority of public funding appropriated to research institutions is directly allocated without any basis in an objective evaluation of the performance and quality of the work undertaken therein[17].

The ratio between competitive funds and block funding has been in the range of 15-20% for competitive funds and 80-85% for block funds. This low level of competitive research funding has for many years been identified as a challenge to the Icelandic research and innovation system.

With the relative increase in funding for competitive funds in 2013 a step was taken in the right direction and the funding of competitive funds as a proportion of R&I increased to 24%.

Private R&D performers receive limited government support. A tax reduction scheme was introduced in 2010 which allows companies tax deductions for up to 20% of costs incurred in R&D projects (within the limit of annual project costs of € 625.000 per company).

If the company is in a tax position, the 20% refunding is done through the income tax system by lowering the taxes. If the company accounts run with a loss and are not levied with income tax for the accounting year, the 20% of R&D costs are refunded directly to the company. Tax deductions were € 3 Million for 2011 and € 5.2 Million for 2012. For 2013, the deductions are expected to be about € 6.9 Million. The two years that the law has been in effect there have been 250 projects from 140 legal entities approved as research and innovation projects. With these

[17] http://rannis.is/media/72153/Ný%20sýn%20vef.pdf

measures it is anticipated that funds from the private sector towards research and development will increase considerably.[18]
The result of these changes is that the indirect government support to R&D has increased to the level where it can be said to be important in the bigger picture.

2.2.2.2 Government direct vs indirect R&D funding[19]

Except for the funds flowing from the competitive funds and the tax reduction scheme there is no other direct government support. After the crash companies were encouraged to hire from the unemployment registry and when researchers were on the registry it was possible to hire them to do research and get the equivalent of the unemployment benefits as a subsidy. As there are now so few researchers unemployed this is no longer an effective remedy.

There is scarce financing available for innovation, be it grants, equity or loans. This has led to start-ups that are becoming viable, seeking funding from abroad. If they are successful they often move their operations partly or completely abroad. Part of the explanation for this is that the currency controls that were established after the financial crisis are discouraging investors away from moving money into the country.

There is no end to end program in place that supports the entire value creation chain from start to finish. It is for example difficult to secure financing unless you have real estate collateral and start-ups have limited access to these.

2.2.3 Thematic versus generic funding

Since its establishment in 2003 the Science and Technology Policy Council has devised multiannual strategies for research and innovation. The strategies are put forward in general terms and are all inclusive and without emphasis on specific sectors. There are really no clear thematic/sectorial R&D policies in Iceland that are approved by the government even though a few steps have been taken in the direction of thematic prioritisation, i.e. creative industries and geothermal energy and sciences. The Strategic Research Programme that was established in 2009, with the aim of fostering outstanding collaborative research is another example. The Programme will run until 2015. It is still unclear what will happen after 2015. Individual agencies that are involved in research have put forward their own strategic emphasis such as The Marine Research Institute and Iceland Geosurvey.

In 2011 25.5% of expenditure on R&D was spent on basic research, 21% was spent on applied research, 42% on development and 11% undefined[20].

Universities performed 75% of basic research, public research organisations performed 47% of applied research and business sector performed 86% of development and nearly all of the undefined research. In 2011 R&D expenditure by business sector was highest in the IT sector

[18] http://rannis.is/media/72153/Ný%20sýn%20vef.pdf and figures from the Ministry of Finance and Economic Affairs
[19] Government direct R&D funding includes grants, loans and procurement. Government indirect R&D funding includes tax incentives such as R&D tax credits, R&D allowances, reductions in R&D workers' wage taxes and social security contributions, and accelerated depreciation of R&D capital.
[20] Figures from Rannis. Not published yet.

with € 44.3 Million, followed by manufacture of chemicals and pharmaceuticals with € 31.2 Million[21].

Although there is a lack of qualified staff in some sectors such as applied sciences, no action has been taken to increase the number of students in corresponding sectors. As no emphasis has been put on specific sectors and grand challenges have not been defined, it is not possible to assess how resource allocations reflect "the grand challenges".

2.2.4 Innovation funding

The governmental funding can broadly be divided into three categories. The biggest funds in each category are:

a. **Research funding**
   The role of the Icelandic Research Fund is to enhance scientific research in Iceland by awarding funding for research projects. The Fund allocated € 8.5 million in 2013 on competitive basis.

b. **Funding for research and innovation**
   The Technology Development Fund supports research and development activities, which aim towards innovation in Icelandic industry. The Technology Development Fund is a competitive fund that mainly funds applied research in companies. Projects can also be carried out in cooperation with research organisations or universities. The Fund allocated € 8.2 million in 2013 on competitive basis.

c. **Funding for innovation**
   Innovation Center Iceland supports the environment for innovation in Iceland. ICI oversees the Action for Job Creation support scheme that allocates grants to innovation projects and marketing activities of entrepreneurial and innovation start-up businesses. In 2013 it allocated € 0.4 Million.

   The Ministry of Industries and Innovation has signed so called "Growth agreements" with 8 regional development agencies. The main objective of the growth agreements is to increase innovation and competitiveness of the regions by allocating grants on competitive basis. In 2013 the Growth agreements were supported by the Ministry by € 1.3 million.

As the figures show far the biggest share is directed to research. However there is an emphasis on increasing the share of funding for innovation. An example of that are the growth agreements. The first one was signed 10 years ago. Now there are 8 growth agreements that cover the whole of Iceland where regional aid is allowed according to the regional aid map 2008-2013.[22]

[21] Figures from Rannis. Not published yet.
[22] http://www.eftasurv.int/press--publications/press-releases/state-aid/nr/436

2.3 Research and Innovation system changes

A report called "NÝ SÝN - Breytingar á vísinda- og nýsköpunarkerfinu" (NEW VISION - changes to the Innovation and science system) was published in December 2012 by the office of the Prime minister. The report, written by working committee of the Icelandic Science and Technology policy council, describes the science and innovation programs in Iceland and proposes how they should be developed in the next few years. An open consultation process was utilised in the writing of the report. The Icelandic Science and Technology Policy Council has approved an action plan to implement the proposals put forward in the report.

The new government decided to increase the number of ministers without increasing the number of ministries. This means that there are now two ministers in the Ministry of Industries and Innovation. One Minister of Fisheries and Agriculture and another is Minister of Industry and Commerce. It is to be seen if this change will affect the coordination of government research funds as the funds under the Ministry of Industries and Innovation are now split between the two ministers.

Far the biggest part of research activity takes place in the capital area. Newly announced agreement between the University of Iceland and the pharmaceutical firm Alvogen states that Alvogen will build high tech facilities as part of University of Iceland Science Park starting at the end of 2013. When the facilities are fully operative 200 new jobs will be created. This development strengthens plans of a Science Park in the vicinity of the University of Iceland. DeCODE Genetics, a leading company in analysing and understanding the human genome has been located in the area, where the University of Iceland Science Park is to be built, for many years.

2.4 Recent Policy developments

A new Science and Technology Policy Council (STPC) was appointed in the spring of 2013. The working groups of STPC have been working on a new policy for STPC for 2013-2016. This new policy was accepted by the council in late November 2013 and published in December 2013. It has not been translated into English yet and is still only accessible in Icelandic[23]. The new strategy has four main themes.

1) *Human resources and recruitment*
   Increase the recruitment in the research and innovation sector by strengthening doctoral studies, strengthening science and technology education, shortening the education process and increasing cooperation between companies, research institutions and the education system.
   Subordinate goals; 1.Targeted and diverse education system from primary to higher education. 2. Increase recruitment in science and innovation in Iceland.
2) *Cooperation and efficiency*
   Strengthen the cooperation between universities, research institutions and companies with the aim of increasing impact and efficiency.
   Subordinate goal; 1. Active cooperation of companies and research and education institutions.
3) *Growth and value creation*

[23] http://www.vt.is/media/197441/VTR_Stefna_2013-2016.pdf

Increase funding and investment in research and innovation, both in private and public sector.
Subordinate goals; 1. Increased momentum in science and innovation funding. 2. Increased investment in innovation companies. 3. Effective participation in international funds.

4) *Impact and follow up*
Evaluate the quality and impact of research and innovation activities and support continuous reform.
Subordinate goal; 1. Improved evaluation of quality and value creation of science and innovation activities.

The new STPC policy now runs for 4 years instead of 3. The policy is laid out in general rather than specific terms of how to achieve the goals set out. Considering how much the funding for R&D and universities has been cut, and that funding to the competitive funds is cut in the 2014 state budget, it is clear that it will be a big challenge to achieve the goals that have been set out.

The government has in accordance with its policy statement initiated a review of business regulation, with the aim of simplification and increased efficiency. The objective is to cut red tape and streamline communications with public bodies, while at the same time keeping costs down. This work will focus on small and medium sized companies and is scheduled to be finished early 2014.

An industrial design policy for Iceland 2014 – 2018[24] was signed by the Minister of Industry and Commerce in January 2014. The goal of the policy is to highlight the importance of industrial design in all products, product design and manufacture with the goal of improving the competitive position and profitability of Icelandic industries.

The first governmental fund for design and architecture was formally opened for applications in September 2013. The fund was established by the Ministry of Culture and Education in February 2013. The role of the fund is to increase and enhance knowledge and increase added value in design and architecture. It also supports export of Icelandic design through marketing and travel grants.

The fund will fund projects in the following four categories:
- Research and Development
- Projects
- Marketing and PR
- Travel expenses

A new regional development plan for the years 2014 – 2017 has been written. Consultations and meetings with stakeholders were held as part of the preparations. The Althing is now discussing it and is expected to pass it as a resolution in April 2014.

[24] http://www.honnunarmidstod.is/media/PDF/HONNUNARSTEFNA_LOKATILLAGA.pdf

2.5 National Reform Programme 2013 and R&I

As Iceland is not member of EU no National Reform Programme has been prepared.

2.6 Evaluations, consultations, foresight exercises

One of the elements within the Quality Enhancement Framework for Icelandic higher education is the Quality Board-led reviews at the institutional level. The first cycle of these reviews spans the period 2011-2016. Institutional Reviews on the performance of the Agricultural University of Iceland and Hólar University College were finished in September 2013 .
The review team of the Agricultural University of Iceland concluded that confidence can be placed in the Agricultural University of Iceland's present and likely future arrangements to secure the academic standards of its awards and confidence can be placed in the soundness of the

Agricultural University of Iceland's present and likely future arrangements to secure the quality of the student learning experience.

The review team of Hólar University College concluded that confidence can be placed in the soundness of Hólar University College's present and likely future arrangements to secure the academic standards of its awards but that only limited confidence can be placed in the soundness of Hólar University College's present and likely future arrangements to secure the quality of the student learning experience.

In 2012 the Icelandic national audit office did an audit into the effectiveness of research contributions to universities in Iceland. The audit concludes that the levels of funding that universities receive are only linked in a very limited way to quality and levels of research. The funding of research is said to be opaque but that important improvements have been made in the last few years. Important steps have been taken to improve how universities are run and improve supervision. Despite this there is still no external supervision of the research that goes on in the universities.

In the preparation for the for the policy for STPC 2013 – 2016 the working groups of STPC, the science committee and the technology committee consulted many different parties and stakeholders regarding modulation of the policy.

An Industrial policy for Iceland 2014-2020 is now in the final stage of preparation. Numerous stakeholder meetings and foresight exercises have been held in the design and development process. This new policy will be the first of its kind in Iceland.

A Roadmap on development of the Research Infrastructures in Iceland was prepared in the spring of 2009 by a committee appointed by the STPC. In December the same year the STPC accepted several of the committee´s proposals. However the Roadmap itself was not formally adopted by STPC and financial commitments were not made. On the ESFRI homepage it is stated that no Roadmap for Iceland has been prepared.

2.7 Regional and/or National Research and Innovation Strategies on Smart Specialisation (RIS3)

Regional or National Research and Innovation Strategies on Smart Specialisation (RIS3) have not been implemented in Iceland.

3 PERFORMANCE OF THE NATIONAL RESEARCH AND INNOVATION SYSTEM

3.1 National Research and Innovation policy

Iceland has one of the highest R&D intensities in Europe and has an excellent science base according to The Research and Innovation Performance in EU Member States and Associated countries 2013[25]. Iceland had an R&D intensity of 2.4% in 2011 which is considerably lower than the 3.11% in 2009 but still higher than the EU27 average.

A significant share of total R&D investment comes from the public sector, or 42% in 2011 which is higher than the EU average. The business sector accounted for 48% in 2011 and low business enterprise expenditure on R&D is one of the key weaknesses of the Icelandic research and innovation system.[26] The number of man-years in R&D in 2011 was 3244. For men the number is 1.994 or 61% and women 1.250 or 39%.[27]

The table below shows that Iceland scores low in new doctorate graduates. Part of the explanation is that many Icelanders take their doctorates abroad. It is also worth noting that because of very small population this figure will fluctuate between years. There is a lack of qualified staff in the fields of engineers and computer scientist. Approximately 2% of the workforce has an engineering education in Iceland compared to an average of 4.5 % among other Nordic countries. The lack of labour supply in these areas is a barrier for growth in Icelandic companies. The percentage of population aged 30-34 that have completed tertiary education is considerably higher than the EU27 average, but the percentage of youth with upper secondary level education on the other hand is much lower.

When looking at the strengths and weaknesses of the Icelandic R&I system the following picture appears. Iceland scores highly in scientific co-publications, public expenditure, R&D, SME´s introducing products, process innovation, marketing and organisational innovations. It also scores high in business enterprise research and employment in knowledge-intensive activities. On the other hand it scores low on new doctoral graduates and community trademarks and Community design. Iceland scores low in contribution of medium and high-tech products exports to the trade balance and sales of new to market and new to firm innovations. This should be seen in the light of Iceland´s resources based economy and how small the country is.

Table 2

HUMAN RESOURCES	
New doctorate graduates (ISCED 6) per 1000 population aged 25-34	0.8
Percentage population aged 25-64 having completed tertiary education	44.6
Open, excellent and attractive research systems	

[25] http://ec.europa.eu/research/innovation-union/pdf/state-of-the-union/2012/countries/iceland_2013.pdf

[26] Figures for Iceland from Rannis, not published yet

[27] Figures from Rannis, not published yet

International scientific co-publications per million population	1692
Scientific publications among the top 10% most cited publications worldwide as % of total scientific publications of the country	11.19
Finance and support	
R&D expenditure in the public sector as % of GDP	1.10
Public Funding for innovation (innovation vouchers, venture/seed capital, access to finance granted by the public sector to innovative companies)	N/A
FIRM ACTIVITIES	
R&D expenditure in the business sector as % of GDP	1.64
Venture capital and seed capital as % of GDP	N/A
Linkages & entrepreneurship	
Public-private co-publications per million population	179.9
Intellectual assets	
PCT patents applications per billion GDP (in PPS€)	3.86
PCT patents applications in societal challenges per billion GDP (in PPS€) (climate change mitigation; health)	1.21
OUTPUTS	
Economic effects	
Medium and high-tech product exports as % total product exports	-8.87
Knowledge-intensive services exports as % total service exports	50.32
License and patent revenues from abroad as % of GDP	1.60

Iceland is a very knowledge-intensive country, with over 43% of employment in knowledge-intensive activities and with R&D intensity far above other countries with a comparable industrial structure and knowledge capacity.[28] Iceland has one of the highest R&D intensities in Europe and has an excellent science base. Early stage entrepreneurial activity is among the highest.

A main challenge has been to transform this into economic competitiveness and competitiveness in high-tech and medium tech products and services. Iceland´s strong investment in R&D has triggered high scientific production and very good results in terms of participation in the EC Framework programmes. Another challenge is to increase the numbers of students participating in science, engineering and doctoral studies and there is limited expertise in technology transfer.

3.2 Structural challenges of the national R&I system

Weakness in governance and planning

The Icelandic R&I system is centralised in the sense that the policy and funding is government controlled with the policy being set by the Science and Technology Policy Council (STPC) headed by the prime minister and involves all ministries with responsibilities within the science, technology and innovation domain. The ministers make funding proposals to the parliament regarding R&I through the annual government budget.

It is worth pointing out that the policy of the STPC is not submitted to the parliament and approved by it as a resolution as for example the regional plan.

When examining the policy set by the STPC it can be seen that there is a lack of connection between the stated government policy and how it is implemented through the funding seen in the annual government budget. For example the policy set forward by the STPC for the years 2013-2016, that was approved at the end of November 2013, stated that the funding for R&I as

[28] Countries in the reference group are Ireland, Luxemburg, Netherlands, Iceland and Norway.

a % of GPD should be increased to reach 3% by 2016. It was also stated that competitive funding for universities and research institutions should rise to one third of the total funding by 2016. At the same time that this policy aiming at increasing R&D funding is being set forward by the STPC, which is chaired by the Prime Minister, the budget for 2014 was discussed in the parliament. This budget actually decreases funding for competitive funds in 2014. Policies that are adopted and agreed are not followed with enough determination or with funds to match the policy objectives. It is also a problem for long term planning that the government budget is approved on an annual basis.
In view of the size of Iceland it has been pointed out that there needs to be a clear policy set forward as to in what areas Iceland will emphasise in the future. It is likely to be more successful to put emphasis on fields where Iceland has a competitive advantage. It has also been pointed out that the strong position of block funding contributes to the fact that setting of thematic priorities in public R&D funding is difficult.

Lack of funding
The biggest challenge for the R&I system in Iceland is without doubt lack of funding. It applies both to the private and the public sectors. The proportion of public sector in R&D is high with 42% in 2011 which is an increase from 2009 when it was 40%. According to audited numbers from Rannis the funding for R&D has decreased from 2.9% in 2009 to 2.6% in 2011. Even though the funding for R&D did only decrease from 2.9% in 2009 to 2.6% in 2011 public funding for R&D through the competitive programs decreased by almost 15% between 2008 and 2011. And in addition to that funding for universities, institutes and funds has decreased considerably. The reasons for the decrease in R&D funding are the financial crisis that had a great impact on the public and private finances. There is a lack of end to end support system from basic research to marketing. There are only a handful of grants available each year from the public system for marketing. There is a lack of access to venture capital in the form of equity and loans.

A fragmented system
When viewed in terms of the total population there is a large number of universities and research institutions. There are 7 universities and 14 main research institutions. In addition to these there are a number of knowledge centres. Research is being done by 110 institutions and of these there are 30 with only one research position and less than 30 with 5 research positions or more[29]. The universities are too small and lack financial resources compared to the Nordic countries or the member states of OECD. According to OECD[30] the expenditure of Iceland per student is much lower than the OECD average. Annual expenditure per student in tertiary education in Iceland in 2010, including R&D, was USD 8.725 while the OECD average in the same year was USD 13.528. Funding for universities has contracted by 15% in real terms from 2008 to 2012. Most of the research institutions are quite small and there are 17 different laws governing their operations. Financing for these institutions has contracted by 22% between 2008 and 2012[31]. The result of this contraction is a weakened research environment that is not attractive to young scientists who are entering the workforce. The devaluation of the Icelandic Krona (about 50% since 2008) has not helped either, making it all the more attractive for Icelandic researchers to go abroad for work.

Low level of competitive funding
It has been pointed out for many years that a larger proportion of total funding of R&D should go through competitive funding instead of block funding for universities and research

[29] STPC policy 2013-2017. Accepted 22. November 2013. (Only accessible in Icelandic yet.)
[30] OECD Education at a glance 2013; http://dx.doi.org/10.1787/eag-2013-en
[31] NEW VISION, Forsætisráðuneytið 2012, pages 38-39.

institutions. In the last few years when all parts of the budget have been subject to cutbacks it has not been possible to address these issues. The government did try and made comparatively small cuts to the funding of competitive funds in view of their importance. In 2013 a step was taken to increase the funding for competitive funds, in absolute terms funding was increased by

€ 6.9 Million comparing 2013 to 2012. Together the competitive funds received close to 23% of the total public funds for R&D in 2013.
The demand for grants out of the funds is much greater than can be met with the current funding levels. The number of applications to the Icelandic Research Fund was 266 in 2012. In the same year the number of grants was 47, or 18% of applications. The proportion was similar in 2010. A rough estimate indicates that a third to 40% of the applications are of a high enough quality to deserve grants but the fund available are only enough to grant about 60% of the applications that are thought to be of sufficient quality. In addition to this the grants that are given are not high enough, resulting sometimes in Icelandic scientists having to go abroad if they want to dedicate themselves to the research that they have specialized themselves in.

Evaluation and quality control
It has been pointed out that performance evaluations need to have more impact on the allocation of R&D funds. Around 80% of public funds for research go directly to institutions without any kind of impartial evaluation of the work being done there[32]. The applications that are given grants from the competitive funds are of course evaluated but a comprehensive evaluation of the R&D system has not been carried out in the last few years.

There is a need to increase cooperation between universities, research institutions and companies with the goal of getting better outcomes and increasing efficiencies. The talent pool available for research need to be made larger by strengthening doctoral studies, studies in science and engineering, shortening the time that it takes it get a university degree and increase the cooperation of private industry, research industries and the educational system. The quality and outcomes of research and innovation should be measured and the measurements should be used as a part of cycle of continuous improvement[33].

3.3 Meeting structural challenges

Weakness in governance and planning
The lack of coherence in the public policy in the R&D in the last few years can in large part be attributed to the difficult position that public finances are in and due to this position the funding for all parts of the budget has been cut. This has meant that it was not possible to maintain funding for R&D in real terms let alone increase them. In the last few years a lot of time and effort went into preparations for the accession talks with the EU. In connection with that work a lot of effort was put into analysis of the current situation in Iceland. Following this analysis the need for reform to comply with EU standards was documented including in matters regarding R&D. Even though the accession talks have been postponed and it is uncertain if or when they will be continued it is clear that the process has increased knowledge in the public sector, not least in planning, follow through, governance and evaluation of success. New laws regarding the budget process are being prepared and the aim is that they will make government planning more focused than what is the case today and make more long term planning possible while at the same time increase the steadiness of the process. According to the proposals the government

[32] STPC policy 2013-2016. Accepted 22. November 2013. (Only accessible in Icelandic yet.)
[33] STPC policy 2013-2016. Accepted 22. November 2013. (Only accessible in Icelandic yet.)

shall put forward a five year financial policy[34] in April each year. This will create more stability and give those working in the field of R&D an opportunity to do more long term planning.

Lack of funds

The financial crisis did not only impact the public finances. All sectors in Iceland were affected by the crisis, including companies. Therefore all parts of the economy cut back funds for R&D. The private sector has, as has been previously covered, cut back more than the public sector. This is a particular problem in Iceland as the public sector already had a higher proportion of the R&D expenditure then the EU28 average.

The policy set forward by the STPC for 2013-2016 puts emphasis on increasing funding for R&D. As the economy recovers, and economic growth in Iceland has been higher in 2012 and 2013 than in most of the neighbouring countries, the government has more room to increase funding for R&D. To encourage companies to increase R&D, expenditure on R&D has been made tax deductible to the amount of € 125.000 each year. It can reach € 188.000 if the work is contracted in from the outside. It is estimated that in 2013 refunds will be € 6.9 Million.
It is proposed that the tax system will be used to encourage investment by companies and individuals in science and innovation and that tax incentives will be introduced to increase investment in start-ups. Legislation is being written that would give tax breaks to those that buy stocks in start-ups. Such a law is supposed to lead to better access to funding for start-ups.

A fragmented system

Three out of the seven universities in Iceland are privately owned though the greatest part of the funding comes from the government. Debate has been ongoing regarding how to better utilise the funds available for universities in Iceland through more cooperation or integration.

A network of the public universities in Iceland was established in 2010. The objectives of the Network project are to strengthen and promote the higher education system in Iceland, to achieve more efficient use of resources in university operations and to ensure strong and varied higher education operations throughout the country. Networks have been established between the universities that are meant to enhance both bilateral and multilateral cooperation. The current minister for education has said that it is a priority to change the system and make it more efficient. In the new STCP policy it is recommended that the framework for science and innovation in Iceland should be simplified, integrated, and where appropriate give opportunities to integrate universities and research institutions.

Government efforts to strengthen the universities with increased funding have not been successful as the government finances have not allowed for any additional expenditure in the last few years. As government finances are getting better more funds can be made available and at the same time the government will be able to tie the increased funding to more cooperation between the universities.

Low level of competitive funding

The low levels of competitive funding has for a long time been one of the main weaknesses of the Icelandic R&D system. In the new policy of the STPC for 2013-2016 it has been suggested that competitive funding for universities and research institutions will be increased so that it will be about one third in 2016. At the same time the funding will take into account performance evaluation. With the approval of the 2013 budget, funding for the competitive funds were raised

[34] "http://www.fjarmalaraduneyti.is/media/frettir/frv-til-laga-um-op-fjarmal-26-6-2013.pdf"

but this increase has in part been taken back in the 2014 budget. The explanation for this reduction is that the planned income that was to pay for the increase did not materialise.

Evaluation and quality control

It has been decided to conduct an international evaluation of the Icelandic research and innovation system. In 2013 Iceland volunteered to be peer-reviewed in the context of The European Research Area and Innovation Committee (ERAC) in early 2014. The work has already started and is supposed to finish June 2014.

Table 3

Challenges	Policy measures/actions addressing the challenge [35]	Assessment in terms of appropriateness, efficiency and effectiveness
1. Weakness in governance and planning	Plans to change law so the policy of STPC will be a resolution of Parliament. A new law on the state financial policy, five year financial policy, among other things, is being prepared. An industrial policy for Iceland is being worked on.	The policy will have a much "stronger" voice. Will make all planning and budgeting more stable and effective. Strengthens especially the innovation policy of the government.
2. Lack of funding for research	The budget 2014 cuts the funding for the competitive funds. The new policy of the STPC aims at increasing the funding for R&D setting the goal at 3% of GDP in 2016. A new law that allows tax deductions when buying stock in innovative companies is being worked on.	Weakens the funds. The reason given is that expected revenues did not materialise and the coalition government´s platform emphasises innovation. Better economic outlook for Iceland probably makes this a realistic goal. Makes it easier for innovative companies to access financing.
3. A fragmented system	A network of public universities established. The new policy of STPC proposes revision of Science- and Innovation landscape. Ongoing discussions about mergers of institutions and universities.	Has had considerable effect in the field of cooperation between the public universities. Should reach the private universities too. Overdue Not likely to produce any result unless the government changes law or makes strong financial incentives.
4. Low level of competitive	By the Investment plan that was	The increase in 2013 was a big step in the

[35] Changes in the legislation and other initiatives not necessarily related with funding are also included.

funding	part of the 2013 budget the share of competitive funding was increased to 24%. Part of that increase is withdrawn in 2014. The new policy of STPC proposes that the competitive funding should become bigger part in financing of research institutes and universities in 2016.	right direction. The reduction in 2014 is a big disappointment to the scientific community in Iceland. In light of reduction of the funds for the competitive funds in 2014 it is difficult to see this goal realised unless the state finances improve considerably.
5. Evaluation and quality control	An international evaluation of the Icelandic research and innovation system will be finished in 2014.	The results will be of great help in the planned revision of the science and innovation landscape.

4 NATIONAL PROGRESS IN INNOVATION UNION KEY POLICY ACTIONS

4.1 Strengthening the knowledge base and reducing fragmentation

Promoting excellence in education and skills development

The total number R&D personnel (FTE) researchers in Iceland in 2011 were 3.244. Women accounted for 49% of the total.[36] In the higher education sector, 39% of the R&D personnel were women, 1.057 in number.

According to The Researchers Report, Iceland had the highest portion of researchers in the workforce with 15.5 (FTE) researchers per thousand active labour force (EU average 6.64)[37]. Researchers in the business sector (FTE) per thousand active labour force in Iceland were 6.44 in 2010. Researchers in the public sector (FTE) per thousand active labour force were 8.72.

In the country profile for Iceland 2013[38] it is stated that Iceland has one of the highest R&D intensities in Europe and that it has an excellent science base but that in spite of that it is a challenge for Iceland to transform this into economic competitiveness.

After the collapse of 2008 many Icelanders have left to work abroad with the highest numbers going to the other Nordic countries. As many researchers have got their degrees abroad, it is relatively easy for them to get employment abroad, for example in Norway. It is also a factor that due to the collapse of the currency, Iceland is no longer competitive when it comes to wages when compared to the neighbouring countries. This also makes it difficult to get foreigners to apply for jobs in Iceland.

The University of Iceland has set itself the ambitious long-term goal to become one of the 100 leading universities in the world. According to the Times Higher Education[39] newest ranking of the leading universities it is currently number 251 to 275.

All seven Icelandic universities have signed the Code of Conduct for the Recruitment of Researchers and European Charter for Researchers. The University of Reykjavík is the only HRS4R (Human Resources Strategy for Researchers) Acknowledged Institution in Iceland yet but the other universities are working on being acknowledged.

[36] Figures from Rannis, not published yet

[37] http://ec.europa.eu/euraxess/pdf/research_policies/20130911_Researchers%20Report%202013_FINAL%20REPORT.pdf

[38] http://ec.europa.eu/research/innovation-union/pdf/state-of-the-union/2012/countries/iceland_2013.pdf

[39] http://www.timeshighereducation.co.uk/world-university-rankings/2013-14/world-ranking/range/251-275

The University of Iceland and Matís, the largest research institute in the field of food, food security and biotechnology, signed in the fall of 2013 an agreement to cooperate in food research and security along with collaboration in teaching and research in other fields. The agreement also handles sharing resources, research infrastructure and human resources. By this it aims to create world class conditions in the fields connected to the agreement.

Research Infrastructures
In the end of 2012 an amendment was approved to the "Act on Public Support for Scientific Research No. 3/2003. One of the changes is that the name of the Equipment Fund was changed to the Infrastructure fund and its role expanded accordingly. The Infrastructure fund's role is to support research infrastructure in Iceland by financing purchase of equipment, databases, software and any other research infrastructure that is important for scientific progress. This includes financing access to domestic or foreign infrastructures and updating existing infrastructures. The Infrastructure fund offers the following type of grants: equipment grant, build-up grant, access grant and update grant (as of 2014).

The following is taken into consideration when proposals are evaluated:

- The infrastructure is important for research progress in Iceland and for the applicant's research.
- The infrastructure creates new possibilities in research and/or is related to research projects already being funded by the Icelandic Research Fund.
- Infrastructure realised with support from the fund shall be accessible to other research groups as capacity allows.
- Cooperation between different institutions and companies.

The launching of the Fund will without doubt improve the research infrastructure. In the spring of 2013 nine proposals received grants to the sum of € 0.7 Million in total.

The University of Iceland's Institute of Research Centres is a venue for the University's collaboration with local authorities, institutions, businesses and individuals in rural areas. Its objectives are to meet the demand for research and education all over Iceland, to provide facilities for research projects dealing with local environmental and societal conditions, to provide facilities for students' field work, to increase access to research based education in rural areas, and to strengthen the University's ties to local enterprises and daily life in rural areas. Seven Research Centres are currently run by the Institute. The Centres employed 26 people in 2011.

4.2 Getting good ideas to market

Improving access to finance
SME's make up the largest share of Icelandic companies. In 2012 nearly 36.000 were employed by large firms in Iceland or just above 25% while SME's employed nearly 75%.
There is a lack of available funding for start-ups and companies focused on innovation. This is true regarding venture capital, grants or credit.

Access to grants for start-ups and companies focused on innovation improved considerably in 2013 with the increased funds provided to competitive funding in the budget of 2013. In addition to this AVS (Increased value of catch, AVS R&D Fund of Ministry of Fisheries and Agriculture in Iceland) provides funds for R&D and development projects that focus on

increased value of fish catch. Grants are available for projects that are involved in different parts of fisheries and fish farming. AVS fund in run by the Ministry of Industries and Innovation.

A number of funds invest in start-ups and innovation companies. Among those are; NSA Ventures (Nýsköpunarsjóður atvinnulífsins) which invests directly in Icelandic seed and start-up companies with high growth potential. It focuses on finding opportunities with the potential to grow profitably on the international market. NSA Ventures is an evergreen fund that has invested in over 145 companies since its inception in 1998. It currently has a portfolio of 39 companies. The majority of its direct investments are in Technology and Life Sciences. NSA Ventures is owned by the state.

Frumtak is another investment fund that invests in start-up and innovation companies that are post seed and show great potential for growth. It has the objective to invest in companies that can become leaders in their field so they not only show good returns but contribute to improve the society in which they operate. Frumtak invests in Iceland but is allowed to invest abroad as a part of the expansion of its portfolio companies. The fund focuses on investments in companies that show great growth potential but does specialize in specific industries. Frumtak is owned by the New Business Venture Fund, three banks and six pension funds.

Today it is difficult for pension funds to find domestic investment opportunities and the currency controls make it impossible to invest abroad. Legislation is being prepared that will make it possible for pension funds to invest in unlisted companies and it is anticipated that pension funds will invest considerable funds in them following the changes.

The loans available are very expensive as interest rates in Iceland are quite high compared to other European countries. It is not uncommon for banks to offer credit with 9% interest rates and for indexed loans 6%. It is also a problem that often the start-ups and innovation companies lack the collateral that is most often required when applying for loans with Icelandic banks.

The competitive funds have been evaluated by external experts. The results of the impact assessment of The Technology Development Fund indicate that the fund has considerable impact in providing important support as the main foundation for innovation at national level[40]. The AVS R&D Fund has also been evaluated but comparison to other countries is not on regular basis.

Protect and enhance the value of intellectual property and boosting creativity

Intellectual property rights and the protection of intellectual property are substantially dependent on international co-operation. Iceland is party to a number of international agreements in this field. The principal international bodies in the field of intellectual property rights of which Iceland is a member:

- World Intellectual Property Organisation
- The European Patent Office
- The Nordic Patent Institute

In addition to this Iceland has implemented all the directives of the EU in the field of intellectual property rights to avoid these issues to be a barrier for researchers.

40 http://rannis.is/files/Technology%20Development%20Fund%20impact%20assessment%20ENsummary_1867439430.pdf

Public procurement
It is the policy of the government to support innovation and innovative solution through public procurement when possible. The law on Public Procurement states in Article 1 that the aim of the legislation is to ensure the equality of companies when it comes to public procurement, to promote efficiency in the public sector by way of effective competition and to promote innovation and development when it comes to public procurement of goods, tasks and services. There is no formal target on public procurement of innovative goods and services.

The State Trading Centre does advise on and encourages innovation by using public procurement and public tenders. It estimates that 12% of all public tenders include innovative criteria one way or another. 13 public tenders for joint public procurement of innovation have been launched in 2013.
Iceland participates in a Nordic 'lighthouse project' in health care to strengthen the collaboration between Norway, Finland, Sweden, Denmark and Iceland on innovation procurement.

4.3 Working in partnership to address societal challenges

European Innovation Partnerships approach has not been implemented in Iceland.

The high levels of unemployment following the crisis required a coordinated effort of state and local government, unions and businesses along with the educational sector. Businesses were invited to hire from the unemployment rolls to work on new initiatives and got support from the state unemployment fund. As unemployment has been reduced this program is less used now.
The employment rate in Iceland is much higher than the average in EU. In 2011 it was 80.5% (for 20 to 64 years) and 81.4% in 2013. The newest figure for EU is 68.4%[41].
The share of population at risk of poverty or social exclusion is 12.7% in 2012 while the average for the EU is 24.8%[42].
Life expectancy in Iceland is among the highest in the world.

Lifelong learning and development of adequate skill are areas that receive support but due to big budget cuts support has been cut down.

4.4 Maximising social and territorial cohesion

As Iceland is not member of EU a National Smart Specialisation Strategy has not been prepared for Iceland.
Because the Icelandic government decided to halt the accession negotiations with EU last June all pre-accession funding by EU has been stopped. What happens next, and when, is not clear.

The principal objectives of the Regional Development Plan 2010 – 2013 were to improve conditions for residence, innovation, and sustainable development in all parts of Iceland, and to strengthen the education, culture, communities, and competitive position of towns and communities nationwide through a variety of measures[43].
The problem is that the funds for implementing the Plan are very limited or € 1.8 Million in 2014.

[41] http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do
[42] http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tsdsc100&plugin=1
[43] http://www.byggdastofnun.is/static/files/Byggdaaetlun1013/Thingsalyktun_enska.pdf

In addition to that the Regional Institute supports and strengthens local development by the provision of credit and other forms of financial support, with the aim of improving economic and living conditions particularly in those regions threatened by depopulation.

4.5 International Scientific Cooperation

No special action has been taken to increase the attractiveness of Iceland as a destination for research. Due to the steep fall of the exchange rate of the Icelandic Krona and the currency restrictions foreign companies do not consider it attractive to invest in Iceland. This also makes it unattractive for foreign researchers to seek employment in Iceland.
The formation of a knowledge cluster in connection with the University of Iceland is underway. The emphasis there is to create a work environment that would make it easier to keep Icelandic scientists in the country after they finish their degrees, many of which are from foreign universities.

Official policy in Iceland emphasizes the importance of international research cooperation. The main focus is on the European Research Area and integration in the Nordic R&D programs. There are bilateral agreements with United States and China. Priorities are on geothermal energy, geology, marine biology, Arctic studies and medical research.

It has to be kept in mind that the size of Iceland and the constraints on available manpower and capital limits the number of initiatives that Iceland can take part in.

Nevertheless, according to the Innovation Union country profile on Iceland 2011, Iceland's strong investment in R&D has triggered high scientific production and very good results in terms of participation in the EC Framework programs. The economy is very knowledge-intensive as illustrated both by the level of employment in knowledge intensive activities and the high number of business researchers per thousand labour force. A challenge for Iceland is to increase the numbers of students participating in science, engineering and doctoral studies. There is limited expertise in technology transfer in Iceland. However, recently, there has been an increase in expertise within the field of technology transfer through successful research and development active companies.

Rannis coordinates and promotes Icelandic participation in collaborative international projects in science and technology. This includes participation in joint international research programmes and funding schemes such as the EU's FP^7 on behalf of the Ministry of Education, Science and Culture. Participation is supposed to lead to better and more cooperation of Icelandic research institutes and with research institutes in other European countries. Cooperation makes it possible to strengthen research infrastructures and creates opportunities for small research institutes to pool their resources so they can work on bigger research projects. Iceland ranks 2nd in term of applicants success rate and 1st in terms of EC financial contribution success rate among candidate countries in FP^7 according to Innovation Union Competitiveness Report 2013 (Iceland).

Participation in international scientific programs is considered to have been very important for the Icelandic scientific society.

The Icelandic Research Fund offers three types of grants to encourage Icelandic participation and research cooperation under the FP: “Travel grants” for Icelandic participants to meet potential partners, “Outreach grants” for Icelandic participants participating in project proposals and “Application grants” for Icelandic participants that apply as coordinators. A scheme for

supporting incoming researchers as well as outgoing is also within the limits of the Research Fund.

Transnational mobility has been encouraged by Iceland's participation in Marie Curie START program. Iceland participates in the Euraxess initiative.

5 NATIONAL PROGRESS TOWARDS REALISATION OF ERA

5.1 More effective national research systems

All applications to the Competitive Funds are judged on merit of excellence. All applications must be written in English. All allocations of grants are based on the core principles of internationals peer review. Applications for funds are judged by expert panels that have members outside Iceland.

An emphasis on a uniform quality control is apparent in HEI legislation, but no clause on quality control can be found in legislation on research institutions. Public research funding for HEI and research institutions mainly takes the form of block grants in the national budget. Governmental appropriations to research institution are not based on a comprehensive policy on budgetary targets, but rather on the specific needs of institutions and industries.

Currently, each and every HEI has established its own quality control system to evaluate research performance, one of which is collectively utilised by the public HEIs. Quality control of HEIs, concerning both research and teaching, is carried out with both internal control within the institutions and a systematic external control. In the fall of 2010, the Minister of Education, Science and Culture appointed a University Quality Council, which is hosted by Rannis. Amongst the Council's objectives is to ensure the quality of higher education activities in Iceland. All members of the Council are foreign experts, and they are not directly involved in the evaluation of Icelandic HEIs, as the evaluation itself is conducted by experts within each respective field.

Performance indicators for research have been included in the University of Iceland's Strategic Plan in negotiations with the Ministry of Education, Science and Culture. Similar agreements have been made with the other universities.

5.2 Optimal transnational co-operation and competition

Official policy in Iceland emphasizes the importance of international research cooperation. Rannis on Iceland's behalf participates in a number of ERA-Net projects some of which have the objective of becoming established Article 185 initiatives in the future. Eurostars has been running as an Article 185 initiative since 2008, with Icelandic participation from the start. Iceland is participating in one JPI (Joint Programming Initiative), namely the JPI on healthy and productive seas and oceans (DEEPFISHMAN).

High emphasis is placed on integration in Nordic R&D cooperation programmes. Iceland participates in The Nordic Top-Level Research Initiative (TRI) the largest Nordic-funded research programme to date.

One of the objectives of The Centre's of Excellence programme that will run until 2015 is to create better intersectoral and cross-border cooperation.

A scheme for supporting incoming researchers as well as outgoing is within the remits of the Research Fund. The competitive funds are in general open for foreign participation, including funding for foreign participants. Same funding rules apply for foreigners.

An international peer-review of Icelandic funding in Eurostars and ERA-nets is recognized. A peer review of the Icelandic research and innovation system will be conducted in early 2014.

In 2013 the Icelandic state contributed € 7.5 million to international organizations and the FP[7].

5.3 An open labour market for researchers

Iceland is part of the European Economic Area (EEA) which includes free movement of people. Hence, EU citizens do not need work permits to enter the Icelandic labor market. Iceland is also part of the Schengen area. However, Iceland does not participate in the Scientific Visa Package arrangements for long term admission.

All seven universities have signed up to the "European Charter for Researchers" and the "Code of conduct for the recruitment of researchers". The University of Reykjavík is a HRS4R Acknowledged Institution.

The language barrier is high as even people speaking other Scandinavian languages do not understand Icelandic. English is widely spoken and some courses at universities are taught in English. This means that in many sectors it is quite possible to be employed without being able to speak Icelandic.
There is a lack of job opportunities for researchers due to tight budgets for research. In the last one or two years there has been a big increase in enquires by scientists, from the Mediterranean and the Baltic countries, looking for job. A few have been employed by various institutions, some of whom have been losing their Icelandic scientists to foreign institutions, especially Scandinavian, because of higher wages there. The Icelanders have the advantage of learning a Scandinavian language in primary school so it is relatively easy to adapt in another Scandinavian country.

Trans-border funding flows from national programmes is not permitted.

Iceland participates actively in the EURAXESS network. Rannis is a formal member of the EURAXESS network and is responsible for providing mobile researchers with information and access. There is one central Euraxess point in Iceland.

Three universities have been accredited by the Ministry to run doctoral training. Research excellence is the cornerstone of all doctoral training in Iceland.

The START Postdoctoral Fellowship programme is administered by Rannis through the Icelandic Research Fund (IRF), in partnership with the European Commission FP[7] (People) under "Marie Curie Actions".

Fellowships without mobility (funded solely by the IRF), is open for researchers of all nationalities who wish to pursue research in Iceland, without mobility.

5.4 Gender equality and gender mainstreaming in research

Iceland was number one on The Global Gender Gap Index in both in 2011 and 2012. The ratio in 2012 was 0.8640. Men performed 61% and women performed 39% of work done in R&D in 2011 (FTE).

The majority of enrolled students in universities in Iceland are women. However they are still a minority in science and engineering but their proportion there is increasing fast.
The University of Iceland has Gender Equality Advisor employed and all the universities have their own Gender Equality action plan.
In 2011 53% of PhD graduates were men and 47% women. This ratio fluctuates between years. In 2009 women were 60% of the PhD graduates.

Access to day care has been stressed as a key factor in ensuring gender equality in the labor market and vast majority of pre-school children attend kindergarten.

The gap in remuneration between women and men researchers in Iceland is approximately 10%. All EU directives concerning gender equality have been implemented in Iceland.

In 2011 the parliament approved a new Plan of Action on Gender Equality for the period 2011-2014[44]. Gender mainstreaming is required in all government policies and in decision making, according to the Act on Gender Equality. According to the Plan of Action a comprehensive four years programme on gender mainstreaming shall be included in the policy formulation and decision-making of ministries and government institutions.

The Act on gender equality stipulates that equal participation of women and men shall be promoted in committees, boards and councils under the auspices of the Government. Consequently, this applies in all bodies within the field of science and higher education.

The research funding agencies do not have any clauses in their selection criteria that lead to increased gender participation in research. Neither are there any practices or criteria that hinder the career of female researchers. Research funders do not pose any gender equality related conditions in their grants.

5.5 Optimal circulation, access to and transfer of scientific knowledge including via digital ERA

The Berlin Declaration was signed by the STPC in 2010 and the National and University Library of Iceland in 2012. In the end of 2012 an amendment was approved to the "Act on Public Support for Scientific Research" that stipulates that research findings, funded through the funds governed by these laws shall be available in open access unless other exceptions have been agreed upon.

The STPC policy 2010 to 2012 emphasized open access to databases and electric journals.

[44] http://jafnretti.is/D10/_Files/Gender%20Equality%20Action%20Programme%202011-14.pdf

In January 2013 Rannis, in accordance with the new law, included a clause in all contract with grantees which states that scientific publications based on projects, funded entirely or partially by Rannis must be published in Open Access. Still the mandate extends only to all peer-reviewed articles not to other science publications, science results or research data, and not to projects that have received grants from Rannis prior to January 2013, even though Rannis encourages all researchers to publish in Open Access.

There are open repositories maintained by Landspitali University Hospital and the National and University library. A national synchronized repository (CRIS based on CERIF) is being planned in 2013/14.

Iceland features a setup called the Iceland Consortia for electronic subscriptions, hosted by the National and University library. It serves not only academics and research institutions but each and every computer in the country that is connected to the Internet through an Icelandic Internet Service Provider (ISP). Thus access to 8.000 journals in full-text, 2.000 journals in A&I and 12 databases are open in all of Iceland, around the clock, irrespective of location or affiliation. The agreement with the publishers also includes electronic subscriptions to journals that are not included in the consortia at a reduced cost to national libraries.

Every citizen in Iceland has an electronic identity and foreign researchers are also given an id number. As a part of the official repository, as per above, this id number will be the electronic identity for accessing digital services.

ANNEX 1. PERFORMANCE THE NATIONAL AND REGIONAL RESEARCH AND INNOVATION SYSTEM

Feature	Assessment	Latest developments
1. Importance of the research and innovation policy	(+) The composition of the STPC shows how important the research and innovation policy is supposed to be in Iceland. The council is chaired by the Prime Minister and 3 other ministers sit on the council. (-) The allocation of funds in the government budget for research and innovation does not match the goals set in the policy.	A new policy of the STPC for the years 2013 – 2016 was published in December 2013. This is the national policy on science, research and innovation in Iceland.
2. Design and implementation of research and innovation policies	(+) The STPC was established in 2003 with the role of promoting scientific research and encouraging technological progress in Iceland. It is the main body responsible for developing and adopting the general policy for science and technology. The council is chaired by the Prime Minister, and in addition 3 other ministers sit on the council. Sixteen members from the public and the private sector are appointed to the council. (+ -) The STPC policy is a 4 year policy document. It is a general national policy, not sector specific. (- +) There is no formal network in place but due to the very small population informal contacts are frequent. (+) The STPC policy reflects ERA priorities where possible.	In the new policy there is set a goal of assessing the quality and result of scientific- and innovation work. There is monitoring and review system in place, but in some cases there are no international evaluators due to high costs. An ERAC peer review of the Icelandic R&I system has already begun and will finish in June 2014 It is necessary to remember that due to the extremely small population of Iceland the strategies and policies are usually general, not specific.
3. Innovation policy	(-) There is no specific innovation policy in Iceland. The STPC policy also includes innovation. (+) The Innovation Center Iceland encourages innovation and promotes the advancement of new ideas by providing active participation and support to entrepreneurs and businesses. (-) Lack of funding.	The policy statement of the new government emphasizes innovation in all sectors.
4. Intensity and predictability of the public investment in research and innovation	(+) The R&D intensity is one of the highest in Europe and more than 42% of total R&D investment comes from the public sector, which is higher than the EU average. (-) The funds for universities and research institutions have decreased from 2008 to 2013 so multi annual planning is difficult. (+) Legislation on tax incentives encourages companies to invest in research and development.	The new government has in its budget for 2014 cut funding for the competitive funds. The tax incentive will result in tax deductions of € 6.9 Million in 2013. Similar tax incentives are planned for persons buying

		stock in innovative companies.
5. Excellence as a key criterion for research and education policy	(+) Applications for grants from the competitive funds are judged on merit of excellence. (-) Block funding for higher education and research institutions is allocated by the finance law and are only in a limited way linked to quality and levels of research. (+) The competitive funds are in general open for foreign participation. (-)Compared to 27 other European countries, Icelandic HEIs have little organisational independence, financial independence is also little, independence in relations to human resources is average and academic independence is great (+) Legal and social frameworks for research careers and doctoral studies are attractive for both men and women. (-) Financial frameworks are weak.	An ERAC peer review has begun. Quality reviews on higher education institutions have begun and will finish in 2016. It must be kept in mind that financial resources are scarce.
6. Education and training systems	(-) No measures have been taken to secure sufficient supply of graduates in science, technology, engineering and mathematics. The same applies to vocational training. (-) Newly released PISA education ranking places Iceland lower in 2012 than in 2009. (+) The curricula of the primary schools have focus on teaching the students teamwork, creativity and critical thinking. (-) No special attention is paid to address innovation skills gaps or entrepreneurship education and training.	Discussion is ongoing but no decisions on concrete steps for change within the education system have been taken yet.
7. Partnerships between higher education institutes, research centres and businesses, at regional, national and international level	(+)Cluster formation is actively encouraged. The biggest clusters are the Icelandic Ocean Cluster and the Iceland Geothermal Cluster. (+) A formation of a knowledge cluster in connection with the University of Iceland is underway. (+) University of Iceland has set up knowledge centres in 7 places outside the capital area. (+) The University of Iceland and Matis, a large research institute, have signed a cooperation agreement on research. (+) The universities, research institutes and private companies have increasingly cooperated in the last few years. (-) Although there are no legal obstacles to set up transnational partnerships in Iceland the currency restrictions make it difficult.	The biggest clusters have grown very fast recently and are expected to continue to do so. Cooperation between universities, research institutes and private companies has shown many outstanding results. Successful spin-offs that have been able to attract venture capital. The lifting of the currency restrictions is one of the primary goals of the government.
8. Framework conditions promote business investment in R&D, entrepreneurship and innovation	(-) As described earlier there are no direct policies to promote innovation and entrepreneurship only the STPC policy. (-) Venture capital market for early stage investments is lacking. (+) The bankruptcy legislation in Iceland is relatively friendly to those who go through bankruptcy. (+) Iceland is a party to a number of international agreements that protect intellectual property and has implemented all EU directives in the field.	The government is preparing a new law that allows tax deduction when buying stock in innovative companies.
9. Public support to research and innovation in businesses is simple, easy to	(+) The support schemes are first and foremost the competitive funds run by Rannis and support to innovators and businesses from Innovation Center Iceland. (-) The support schemes are greatly underfunded. (+) As the great majority of Icelandic businesses are SMEs,	

access, and high quality	the funding is limited and grants are small it is clear that funding is suited to that size of businesses. (+) Applications for funds are judged by expert panels that have members outside Iceland. (+) Transnational co-operation is encouraged and the rules are aligned to facilitate in EU programmes open to Iceland. (-) No specific support is available to young innovative companies.	
10. The public sector itself is a driver of innovation	(-) There is no formal target on public procurement of innovative goods and services. (+) The policy of the government is to make access to government owned data open to all.	

ANNEX 2. NATIONAL PROGRESS ON INNOVATION UNION COMMITMENTS

		Main changes	Brief assessment of progress / achievements
1	**Member State Strategies for Researchers' Training and Employment Conditions**	All universities have signed the charter and code. University of Reykjavík has been HRS4R Acknowledged Institution Performance indicators for research included in University of Iceland´s Strategic Plan in negotiations with the ministry Institutional Reviews on the performance of the Agricultural University of Iceland and Hólar University College were finished in September 2013 Considerable increase in public R&D funding in 2013 through competitive funds but partly withdrawn in 2014 budget Assessment on the results of the Research Fund and a new assessment on the Technology Development Fund are being prepared and will be done next year	(+)No formal barriers to recruiting non - nationals (+)All positions are open to citizens of EEA area (-)No systematic promotion of Charter and Code by national authorities (+)Work in progress setting performance indicators for other universities (+)First round of institutional reviews on performance of all universities complete (+)Increase in R&D funding increases job opportunities for researchers Assessment on the results of the funds indicate if they fulfil their role and live up to expectations
4	**ERA Framework**		
5	**Priority European Research Infrastructures**	Iceland has participated in the preparatory phases of several ESFRI infrastructures (CLARIN, ESSurvey, EPOS, LIFEWATCH, BBMRI, ECRIN, ELIXIR, ESSneutrons) and is currently involved in the next phase.	(+) Iceland is also a member of other International infrastructures such as EMBL, GBIF, GBIF, GEANT, ICDP and NOT. (+-) A Roadmap on development of Research Infrastructures in Iceland was prepared in 2009. The Roadmap itself was not formally adopted and financial commitments were not made.
7	**SME Involvement**	Work in progress on Iceland´s participation in H2020 Iceland has participated actively in EEN (Enterprise Europe Network and preparations for participation in COSME are ongoing.	(+) Emphasis on SME´s participation in projects in all fields (+)Participation in programme called SME´s & Access to Risk Finance

11	**Venture Capital Funds**	The new government platform stresses the importance of improving access of start-ups to equity capital. Legislation is being written that would give tax breaks to those that buy stocks in start-ups.	(+) Such law will lead to better access to funding for start-ups
13	**Review of the State Aid Framework**	A new regional aid map for the years 2014 – 2020 is being prepared.	(+) Probably no change from present aid map.
14	**EU Patent**	This does not apply to Iceland and there are no plans of applying for participation	
15	**Screening of Regulatory Framework**	The government has initiated a review of business regulation with the aim of simplification and increased efficiency	(+) Improves the working environment especially for small and medium sized companies
17	**Public Procurement**	The State Trading Centre estimates that about 12% of public tenders include innovation criteria and that 9 big public tenders in 2013 include objectives that support innovation	(-)No national target on public procurement of innovative goods and services and no updates
20	**Open Access**	From 1.1.2013 researchers that receive funding from RANNIS must guarantee that their research findings will be available through Open Access within 12 months from publication National synchronized repository, planned in 2013/2014 is under construction Iceland Consortia for electronic subscriptions secures all computers in Iceland free and open access to scientific journals and databases worldwide Every citizen in Iceland has an electronic identity. Foreign researchers residing in Iceland are given same kind of electronic identity. This identity serves as electronic identity for accessing digital research services	(+)Secures public access to results of publicly funded research findings (+) National repository in final stages (+) Open access is in place (+) Electronic identity and transnational access already in place

21	**Knowledge Transfer**	No policies or instruments to protect the results of publicly funded research when they have been published but individual agreements have been made to protect ownership of patents. The University of Iceland and Landspítali – The National University Hospital renewed a cooperation agreement in December 2012 and operate a joint KT and TT office. New venture capital investment funds established Increase in public funds to support marketing activities. The Investment Plan for Iceland 2013-2105 increased funding to the Competitive funds considerably in 2013. The first governmental fund for design and architecture was formally opened for applications in September this year	Discussions have been going on about setting up one KT/TT office in Iceland. That office is supposed to coordinate KT/TT policy. There is still some time till decisions are made. (+)The Technology Development Fund encourages cooperation between academia and research institutes on one hand and entrepreneurs on the other. (+)Better funding of the competitive funds and new venture capital funds have increased support both in form of grants and venture capital. (+)Innovation Centre Iceland runs a range of KT programmes which are in line with national policy. These include support programmes, Technology transfer services and support as well as education and training (+)There are no legal or regulatory barriers to the transfer of knowledge between the public and the private sector (-)Progress has been made in many fields but the steps are very small.
22	**European Knowledge Market for Patents and Licensing**	If this applies to Iceland no steps taken yet	
23	**Safeguarding Intellectual Property Rights**	Iceland is a member of The World Intellectual Property Organisation, The European Patent Office and the Nordic Patent Institute. Iceland has implemented all directives of the EU in the field of intellectual property rights.	The issue of intellectual property rights should not be a problem for researchers
24	**Structural Funds and Smart Specialisation**	This does not apply to Iceland	
25	**Post 2013 Structural Fund Programmes**	This does not apply to Iceland	
26	**European Social Innovation pilot**	This does not apply to Iceland	
27	**Public Sector Innovation**	This does not apply to Iceland	

29	**European Innovation Partnerships**	This does not apply to Iceland	
30	**Integrated Policies to Attract the Best Researchers**	No action taken	
31	**Scientific Cooperation with Third Countries**	Iceland participates actively in NORIA, the Nordic Research and Innovation Area Bilateral agreements with among others, US and China Priorities are on geothermal energy, geology, marine biology, arctic studies and medical research.	(+)Cooperation with other countries has created numerous contacts and funds that has made it possible for many Icelandic researchers to work in their scientific fields in Iceland (+)Cooperation in research has created knowledge and new products
32	**Global Research Infrastructures**	Cooperation with China in many fields of research, among others, Arctic studies (in cooperation with other Nordic countries), studies of Aurora borealis Cooperation with United States has a long story, is very extensive and many institutions in US have cooperated with institutes in Iceland and supported development of scientific infrastructures in Iceland	(+)Cooperation with such a big countries opens a big arena of research that otherwise would be closed for such a small country as Iceland.
33	**National Reform Programmes**	This does not apply to Iceland	

ANNEX 3. NATIONAL PROGRESS TOWARDS REALISATION OF ERA

ERA Priority	ERA Action	Recent changes	Assessment of progress in delivering ERA
1. More effective national research systems	MS01 Action 1: Introduce or enhance competitive funding through calls for proposals and institutional assessments	Public research funding has been increased. Share of competitive funding has increased. Funding for HEI and RI are block grants without assessment.	(+) Increase in public funding is step in right direction (although clouds on the horizon). (+) Share of competitive funds has increased. (-) Block grants still used for HEI and RI in spite of recommendations for changes of methods of financing.
	MS02 Action 2: Ensure that all public bodies responsible for allocating research funds apply the core principles of international peer review	The competitive funds use peer reviews when allocating funds	(+) Peer reviews are now the standard method when allocating funds.
2. Optimal transnational co-operation and competition	MS06 Action 1: Step up efforts to implement joint research agendas addressing grand challenges, sharing information about activities in agreed priority areas, ensuring that adequate national funding is committed and strategically aligned at European level in these areas	The Centres of Excellence Program aims to create better intersectoral and cross – border cooperation. Iceland participates in various international scientific programs. The new STPC policy stresses the importance of international cooperation.	(+) The Centres of Excellence program is important in its fields. (+) Participation in international scientific programs has been very important for the Icelandic scientific society. (+) It is important that STPC in its policy stresses international cooperation. (-) Steps taken have been small. (-) Difficult to see how national funding will be secured.
	MS07 Action 2: Ensure mutual recognition of evaluations that conform to international peer-review standards as a basis for national funding decisions	All peer-reviews conform to international standards.	(+) Goal is met.

	MS08 Action 3: Remove legal and other barriers to the cross-border interoperability of national programmes to permit joint financing of actions including cooperation with non-EU countries where relevant	The competitive funds open for foreign participation. Same funding rules apply to foreigners.	(-)Small amounts of grants reflected in little demand for grant from abroad (-) International cooperation not given high emphasis
	MS15 Action 4: Confirm financial commitments for the construction and operation of ESFRI, global, national and regional RIs of pan-European interest, particularly when developing national roadmaps and the next SF programmes	Strategic Research Programme launched in 2013.	(+) The Programme will encourage increased investment in research infrastructure
	MS16 Action 5: Remove legal and other barriers to cross-border access to RIs	No legal barriers but not a priority.	(+) Transnational mobility is encouraged by Marie Curie START programme
ERA priority 3: An open labour market for researchers	MS24 Action 1: Remove legal and other barriers to the application of open, transparent and merit based recruitment of researchers	All citizens of the EEA area have the same right to employment as Icelanders. New regulations on higher education institutions require transparency. All universities have signed up to the European Charter for Researchers and the Code of conduct for the recruitment of researchers.	(+) The labour market for researchers in Iceland is open (-) The language barrier is high
	MS25 Action 2: Remove legal and other barriers which hamper cross-border access to and portability of national grants		(-) Trans-border funding flow is not permitted
	MS26 Action 3: Support implementation of the Declaration of Commitment to provide coordinated personalised information and services to researchers through the pan-European EURAXESS3 network	Negotiations with the universities about opening EURAXESS points.	(+) Active participation in the EURAXESS network
	MS27 Action 4: Support the setting up and running of structured innovative doctoral training programmes applying the Principles for Innovative Doctoral Training.	Quality Enhancement Handbook on Higher Education published in 2011. Three universities accredited to run doctoral training.	(+)University of Iceland has decided to apply the Principles of Innovative Doctoral Training

	MS28 Action 5: Create an enabling framework for the implementation of the HR Strategy for Researchers incorporating the Charter & Code	All universities have signed up to the European Charter for Researchers and the Code of conduct for the recruitment of researchers.	(+) Action implemented
ERA priority 4: Gender equality and gender mainstreaming in research	MS39 Action 1: Create a legal and policy environment and provide incentives	All EU directives on gender equality implemented in Iceland. New Action Plan for Gender Equality for the period 2011-2015 approved. Gender mainstreaming required in all government policies and decision making.	(+)Iceland ranks number one on The Global Gender Gap Index in 2012. (-) However, there has not been enough focus on the gender dimension in research.
	MS40 Action 2: Engage in partnerships with funding agencies, research organisations and universities to foster cultural and institutional change on gender	In 2011 three year plan on gender budgeting approved. A special advisor to the prime minister on gender equality issues. All universities have their own gender equality action plan.	(+) Decisive steps have been taken to secure change on gender.
	MS41 Action 3: Ensure that at least 40% of the under-represented sex participate in committees involved in recruitment/career progression and in establishing and evaluating	The Act on gender equality stipulates equal participation of both sexes in committees, boards and councils.	(-+) The goal has not been reached yet but things are definitely moving in the right direction
ERA priority 5: Optimal circulation, access to and transfer of scientific knowledge including via digital ERA	MS45 Action 1: Define and coordinate their policies on access to and preservation of scientific information	From 2013 Rannis has a clause in all contracts that demands publishing in open access. Berlin Declaration signed by STPC and the National and University Library. Bifröst University has an open access policy. Agreement has been made with publishers that secures everyone in Iceland access to journals and databases at no or reduced cost.	(+)Open Access is encouraged by the authorities. (-) A national policy is lacking. (+) Access to scientific databases is secured to everyone at no or substantially reduced cost.
	MS46 Action 2: Ensure that public research contributes to Open Innovation and foster knowledge transfer between public and private sectors through national knowledge transfer strategies	Science Cafés and Researchers Nights are organised by Rannis every autumn with the aim of increase knowledge and interest of the wider public in science and innovation. Growth agreements at regional level funded by the government encourage cooperation between academia, private sector and public sector.	(+) Steps have been taken but they are small and more needs to be done (+) The Innovation Centre Iceland is responsible for knowledge transfer to SME´s (-) Growth agreements have far too little funds to be able to make a real difference

	MS47 Action 3: Harmonise access and usage policies for research and education-related public e-infrastructures and for associated digital research services enabling consortia of different types of public and private partners	An informal fellowship that aims at having the government, universities and others adopt a policy on Open Access.	(+) The informal fellowship, Open Access, has an active website and has held open week and conferences on the subject (-) The authorities have not been active in this field
	MS48 Action 4: Adopt and implement national strategies for electronic identity for researchers giving them transnational access to digital research services	No strategy formulated.	(+) Every citizen in Iceland has an electronic identity and foreign researchers are also given an id number. This id number will be the electronic identity for accessing digital services.

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LIST OF ABBREVIATIONS

AVS	AVS R&D Fund of Ministry of Fisheries and Agriculture in Iceland (AVS rannsóknarsjóður í sjávarútvegi)
BERD	Business Expenditures for Research and Development
COST	European Cooperation in Science and Technology
EEA	European Economic Area
EFTA	European Free Trade Agreement
ERAC	The European Research Area and Innovation Committee
EU	European Union
EU 27	European Union including 27 Member States
FP^7	7^{th} Framework Programme
FTE	Full Time Equivalent
GBAORD	Government Budget Appropriations or Outlays on R&D
GDP	Gross Domestic Product
GERD	Gross Domestic Expenditure on R&D
GNP	Gross National Product
HEI	Higher Education Institutions
HERD	Higher Education Expenditure on R&D
HRST	Human Resources in Science and Technology
ICI	Innovation Center Iceland (Nýsköpunarmiðstöð Íslands)
IPA	Instrument for Pre-Accession Assistance
ISCED	International Standard Classification of Education
ISK	Icelandic króna
IUS	Innovation Union Scoreboard
LL	Iceland Living Lab
NORIA	Nordic Research and Innovation Area
OECD	Organisation for Economic Co-operation and Development
PCT	Patent Cooperation Treaty
PPS	Purchasing Power Standards
R&I	Research and Innovation
R&D	Research and Development
R&D&I	Research and Development and Innovation
RANNIS	Iceland Centre for Research
RIS_3	Research and Innovation Strategies on Smart Specialisation
RTDI	Research Technological Development and Innovation
SME	Small and Medium Enterprises
S&T	Science and Technology
STI	Science Technology Innovation
STPC	Science and Technology Policy Council
USD	United States Dollar

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